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ENTOMOLOGICAL NEWS

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A Revisional Study of the Euptychia pyracmon Group

By RALPH L. CHERMOCK, Ithaca, N. Y.

Doctor Nabokov, in 1942,[1] published the results of his studies of *Neonympha henshawi* and its relatives in the United States. In studying this work, I became interested in the suggested classification and tried to correlate his findings with the Mexican and Central American members of the group and to corroborate and supplement his data on the distribution of those species found in the United States. This study was facilitated by the coöperation of Dr. Walter Sweadner of the Carnegie Museum, who kindly permitted me to study its extensive series; Dr. C. D. Michener, who loaned me material from the collection of the American Museum of Natural History; Mr. William D. Field, who loaned me specimens of Central American species from the collection of the U. S. National Museum; Mr. F. H. Chermock, whose collection was helpful in providing additional data on distribution; Mr. Don. B. Stallings, who kindly furnished me with paratypes of *Euptychia gemma freemani* and its form *inductura;* Mr. Louis Schellbach, who sent me topotypes of *Euptychia dorothea dorothea;* Mrs. R. L. Chermock, who collected extensive series in southeastern Arizona for study; and Dr. W. T. M. Forbes of Cornell University, whose suggestions proved to be most valuable and helpful. To all of these, I offer my sincerest thanks.

The genera *Neonympha, Megisto,* and *Euptychia* were erected by Hübner simultaneously in 1818, in his "Verzeichniss bekannter Schmettlinge," the latter having "page priority." *Cissia* Doubleday, 1848, has also occasionally been used as applying to members of this group. Felder described the genus *Cyllopsis*

[1] Psyche, vol. XLIX, nos. 3–4.

in 1869, in Verh. Zool.-Bot. Gesellsch. Wien, vol. 19, p. 474, the genotype being *C. hedemanni* Felder, 1869, by monotypy. After studying the genotypes of these five genera, I feel that they all represent one genus, since they are extremely similar morphologically. The oldest available name is *Euptychia* Hübner, 1818 and should be applied to this genus. On the basis of genitalic structures and maculation, this genus can be further divided into two groups. The first group which includes the genotypes of *Euptychia, Megisto, Neonympha,* and *Cissia* is easily separated from the other which includes the genotype of *Cyllopsis* and the other species considered in this paper. Consequently I will refer to these species as belonging to the genus *Euptychia,* and subgenus *Cyllopsis.* Whether the remainder of this genus constitutes a single subgenus or not, I leave to future workers. However, the name *Neonympha,* which has often been applied to *pyracmon, henshawi,* etc. by other authors, is incorrect; and the name would more appropriately be considered as a synonym of *Euptychia.*

I have also studied the genotype of *Taygetis* Hübner, 1816, which is *mermeria* Cramer 1779, along with related species; and I am inclined to include this genus also in *Euptychia,* although it may constitute another distinct subgenus. The genitalia are very similar to those of *Euptychia herse,* and the maculation is such that it substantiates the opinion.

Subgenus **Cyllopsis,** Felder

The upper side of both sexes has a general brown ground color, frequently with a reddish suffusion, which changes to yellow in *philodice.* Two black marginal spots are usually present on the secondaries, one between M_1 and M_2, the other between M_2 and M_3. In some specimens, only one spot is present, that between M_2 and M_3; while in other specimens, an additional spot is found between M_3 and Cu_1. These marginal spots are not found in any other Euptychias. The males of many of the species have an androconial patch extending from the inner margin of the primaries to the end of the cell. On the lower surface, the primaries are crossed by four dark transverse lines (see figure 2): the first discal passing through the cell; the

second discal passing around the end of the cell; a submarginal band distal to this; and a marginal band along the outer margin. On the secondaries, these bands still persist but are usually less well defined; and the submarginal band is heavily marked with silver. The marginal spots of the upper surface are ocellate on the lower surface, often pupilled or surrounded with silver. In many species, these spots are bordered basally by a blue-white patch traversed by fine striae. This maculation may be designated as a *marginal patch* and does not occur in other Euptychias. The male genitalia of *Cyllopsis* (see figures 3–11) are basically similar to those of the other Euptychias with the exception of the structure of the socii. In *Cyllopsis,* the socii are short, unarticulated, and curved concavely upward. In all other Euptychias (see figures 1 and 12) and Taygetis studied, which included the various genotypes, the socii are articulated at the base; the tips are strongly directed upwards, often extending dorsad to the uncus, and are either straight or reversely curved. The distinctive genitalic characters coupled with the basic pattern differences are the most diagnostic features of this subgenus.

In contrast to the studies of Dr. Nabokov, my observations have convinced me that the names he listed constitute only two species. In addition, I include several species not considered in Nabokov's paper, in the subgenus *Cyllopsis,* and will discuss my conclusions in the following pages.

Euptychia pyracmon Butler, was described from Oaxaca, Mexico, and, on the basis of specimens examined and records in Godman and Salvin, ranges from Chiriqui, Panama, north to southern Mexico. A specimen examined from Guatemala, collected by Schaus and now in the Carnegie Museum, agrees very well with Godman and Salvin's figure of typical *pyracmon* on Plate 107, figures 11 and 12, and is used as a basis for comparison. Nabokov recorded *pyracmon* from Palmerlee, Cochise Co., Arizona; Globe, Gila Co., Ariz.; and Paradise, Ariz. The author has, in his collection, a specimen from Palmerlee which agrees perfectly with Nabokov's description and comes from the same locality as the plesiotype of that species in the American Museum. On the upper side, it differs from the Guatemalan specimen by having smaller, less accentuated, paired marginal

spots on the secondaries. On the lower surface, the basic pattern is identical in color and shape of markings, although the transverse bands of the Guatemalan specimen are much more heavily accentuated and broader. The Guatemalan specimen agrees with the original description of *pyracmon,* comes from an area nearer the type locality, and I consider it as being more typical than the Arizona specimens. *Euptychia hilaria* described by Godman and Salvin is a synonym of *pyracmon* as far as I can determine from the original description.

E. pyracmon is a polytypic species, the typical form being found in the area cited above, while *henshawi* (Edwards) represents the northern subspecies found in southern Arizona and extending south into Sonora. The basic patterns of the two are similar, with *henshawi* tending to have more red on the upper surface and less intense transverse bands on the underside. The genitalia of *pyracmon* and *henshawi* (see figure 3) are identical save that the uncus of the latter is proportionally slightly longer. The *pyracmon* of Nabokov is nothing more than a color form of *p. henshawi* within the limits of the range of variation of that subspecies.

Euptychia pephredo Godman and Salvin, is found in southern Mexico and Guatemala; and specimens from the latter country were used for comparison. Although this species exhibits certain characters similar to *pyracmon,* to which it is undoubtedly closely related, it can readily be distinguished by the characters given in the key. The male genitalia of *pephredo* (see figure 5) have a much shorter valve and uncus. The distributions of the two species overlap, but each species apparently remains distinct with no interbreeding.

E. dorothea. Nabokov distinguished another species belonging to this group which he named *dorothea,* and the evidence I have substantiates his findings. *Maniola,* however, which he described as a distinct species, is only a subspecies of *dorothea.* Biologically, *dorothea* is distinct from *henshawi* although their ranges overlap. The latter is definitely double-brooded in Arizona, one brood occurring in June and the other in late August and early September. Intensive collecting by Mrs. R. L. Chermock in the areas where both species were

flying together in June, yielded large series of *henshawi* but no *dorothea* in the fall. On the basis of maculation, the two may also be separated by the characters mentioned in the key. The genitalia of *dorothea, maniola, edwardsi* (see figure 4), and *avicula* are all identical.

I have in my collection topotypical material of all of the subspecies of *dorothea* described by Nabokov. *Dorothea* came from Grand Canyon, Arizona; *edwardsi* from Gila Co., Ariz.; *avicula* from Fort Davis, Texas;[2] and *maniola* from the Chiricahua Mts., Ariz. *Maniola* is the most distinctive member of this polytypic species and represents the subspecies found in the Chiricahua, Santa Rita, and Baboquivari ranges of southeastern Arizona. However, the characters given by Nabokov to separate the remaining subspecies vary tremendously and can be found in any population throughout the range of distribution. Although there exist certain trends in these variations, they are insufficiently limited to any geographical area to merit subspecific designation. For this reason, I believe it wiser to consider them as synonyms. The intensity of the transverse markings on the underside of the wings and the extent of the red suffusion on the upper side vary in all populations, and no constant diagnostic features can be found. *Maniola,* however, is relatively constant and can be recognized by the characters given in the key.

Nabokov also emphasized in his work the importance of the distribution of the androconial patches in the male. This character, as in many Satyrids, is subject to great variation; and the stress which was placed on their distribution in separating *henshawi, pyracmon, maniola,* and *dorothea* was found to be unjustified. The most reliable character, I found, for species determination was the male genitalic structures, coupled with the actual basic pattern, not color or intensity.

Euptychia gemma Hübner, is also a member of this subgenus, exhibiting the same basic pattern of maculation and genitalic structure (see figure 6). However, its diagnostic specific

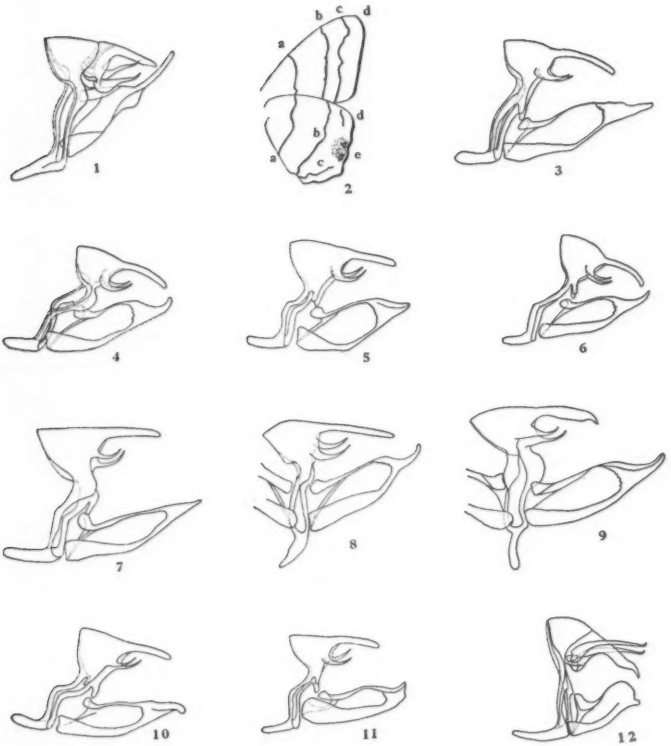
[2] Wind in Pan. Pac. Ent. redescribed this subspecies naming it *texana* from the same locality, thus automatically making it a synonym.

characters given in the key make it easy to recognize. It ranges throughout southeastern United States into Texas. In the tropical belt around Brownsville and Pharr, Texas, it occurs as the subspecies *freemani* Stallings and Turner, extending south along the coast into Mexico. The genitalia of *freemani* and *gemma* are identical, but the characters of maculation and color are sufficient to separate them. *Freemani* represents the winter brood, but Stallings and Turner also separated the summer brood giving it the form name *inductura*. As I feel that variation within a population, whether it be due to environmental influences or the expression of slight genic differences, does not deserve recognition in our nomenclatural system, I am considering it as a synonym. This summer brood is extremely close to typical gemma in its general characters, although the brighter ground color of the wings, along with the slightly heavier transverse bands, can be used to distinguish it. The typical winter form is more easily recognized, having dark, broad, transverse bands and a yellowish suffusion on the lower surfaces.

It is advisable to mention here two specimens which I have had the privilege of examining, each representing an undescribed species. Although I believe it is usually inadvisable to base descriptions on single specimens, I feel that these have sufficiently diagnostic characters to justify their being named.

Euptychia (Cyllopsis) nayarit, new species

Length of wing measured from base to the apex of the primaries, 177 mm. In general, the appearance, color, and maculation of the upper surface, similar to *gemma,* but possessing a well defined androconial patch on the primaries. Lower surface of secondaries: the metallic markings are reduced; the second discal band is heavily margined distally with bright yellow-orange; this same color is found on the submarginal band between M_3 and Cu_1, and on the marginal band; the marginal patch is smaller than in *gemma,* extending only halfway to the second discal band as in *maniola.* The genitalia have a short, straight uncus; and the valves have a distinct process on the lower portion of the tip (see figure 10), not found in any other



EXPLANATION OF FIGURES

1. *Euptychia* (*Euptychia*) *hermes,* Venezuela, R. Chermock Collection. 2. Diagrammatic drawing of lower surface of *E. pephredo: a,* first discal band; *b,* second discal band; *c,* submarginal band; *d.* marginal band; *e,* marginal patch. 3. *E. pyracmon henshawi,* Santa Rita Mts., Ariz., R. Chermock Col. 4. *E. dorothea dorothea,* Globe, Ariz., R. Chermock Col. 5. *E. pephredo,* Guatemala, Carnegie Museum Col. 6. *E. gemma,* Crailhope, Ky., R. Chermock Col. 7. *E. rogersi,* Los Bajos, C. R., U. S. Nat. Mus. Col. 8. *E. argentella,* Mt. Poas, C. R., U. S. Nat. Mus. Col. 9. *E. philodice,* Turrialba, C. R., U. S. Nat. Mus. Col. 10. *E. nayarit,* Type, Cornell Col. 11. *E. pseudopephredo,* Type, Am. Mus. Nat. Hist. Col. 12. *E. herse,* Brazil, Cornell Col.

members of *Cyllopsis*. Apparently, this species is between *gemma* and *pephredo*.

Type: Male, Compostela, Nayarit, MEXICO, Oct. 30, 1942. Cornell University Collection.

Euptychia (Cyllopsis) pseudopephredo, new species

Length of forewing, 17 mm. General ground color of upper surface same as in *gemma,* and also lacking the androconial patch on the primaries. The hind wings, however, are slightly more angulate, suggestive of *pephredo*. The ground color of the lower surface is yellowish-tan, traversed by short, heavy, dark striae. The transverse bands are well defined. Lower surface of secondaries: the marginal patch is reduced as in *pephredo;* the second discal band is slightly margined distally with yellow. The male genitalia are distinct (see figure 11), the valves being relatively broad and terminated by a bluntly upturned tip. This species is fairly closely related to *pephredo* although the genitalia seem to indicate specific distinction.

Type: Male, S. Angel, D. F. MEXICO, June 1910 (C. C. Hoffmann), collection of the American Museum of Natural History, New York City.

Euptychia hedemanni, of which I have two specimens before me from the U. S. National Museum, ranges from southern Mexico to Guatemala and Costa Rica. It is the largest member of this subgenus, wing length 22–26 mm. The primaries tend to be falcate, the secondaries angled, with a somewhat crenulate margin. Other characters which can be used to identify the species are given in the key. Although somewhat modified in appearance from the majority of the members of this subgenus, its genitalic characters, coupled with its basic maculation, indicate its close relationship. Mr. Field of the U. S. National Museum was also kind enough to lend me specimens of *rogersi, argentella,* and *philodice* from Costa Rica, all of which belong to *Cyllopsis;* and their distinctive characters are also outlined in the key. Their genitalia are represented in figures 7 to 9.

I have been unable to obtain specimens of *Euptychia nelsoni* or *E. clinas* for study. However, there is no question in my

mind that they are also referable to *Cyllopsis,* and the characters included in the key are based on Godman and Salvin's illustrations of the types. It appears that *clinas,* which comes from Guerrero, Mexico, is more closely related to *hedemanni; nelsoni,* which was described from Cerro de Zunil, Guatemala, is probably a subspecies of *philodice.*

KEY TO THE SPECIES AND SUBSPECIES OF CYLLOPSIS

**Marginal patch on lower surface of secondaries incomplete: the ocelli are not divided; no patch basal to the ocelli contrasting with the ground color of the wing.*

1. Apex of primaries angulate, outer margin strongly concave. Average length of forewing measured from base to apex usually greater than 22½ mm.....2
   Apex of primaries never angulate, outer margin either straight or convex; length of forewing less than 22 mm.....3
2. Cu_1 of hindwing elongated into a short broad tail; a single marginal eyespot between M_3 and Cu_1 on both surfaces of secondaries. Upper surface: mouse brown, with second discal band pinkish. Lower surface: first and second discal bands straight; area between base of wing and first discal, and also between discal and submarginal bands, lighter and yellowish in color.....*hedemanni*
   Outer margin of hind wing round, slightly crenulate; anal angle elongated into a broad point; 2–3 marginal dark spots on upper side of secondaries. Lower surface of secondaries: 2 well developed marginal ocelli between M_2 and M_3, M_3 and Cu_1; first and second discal bands irregularly jagged; area between second discal and submarginal bands pale in color.....*clinas*
3. Upper surface: 1 black marginal spot between M_2 and M_3, occasionally a smaller one between M_1 and M_2; color, mouse-brown. Lower surface of secondaries: a single well developed ocellus between M_2 and M_3; occasionally a rudimentary one between M_1 and M_2; silver band incomplete *rogersi*
   Two subequal marginal spots on both surfaces between M_2 and M_3, and M_3 and Cu_1, sometimes very reduced in the females.....4
4. Lower surface of secondaries: a broad, straight, yellow-white band, 2 mm. in width, distal to second discal band; marginal ocelli of female reduced; silver submarginal band broken.....5

No broad yellow band on secondaries; marginal eyespots of female not markedly reduced.....6

5. Bright yellow markings on upper side of secondaries distal to the second discal band. Lower surface of primaries: area between second discal and submarginal bands heavily tinged with yellow-white.....*philodice philodice*

No bright yellow markings on upper surface. No yellow-white between second discal and submarginal bands on lower surface of primaries.....*philodice nelsoni*

***Marginal patch on lower surface of secondaries well developed consisting of two marginal eyespots, each in turn bisected, lying between M_2 and M_3, and M_3 and Cu_1; bordered basally by a pale colored patch, often bluish, and traversed by fine striae.*

6. Lower surface of secondaries: second discal band bordered distally by irregular, dentate, orange-yellow markings; the submarginal band bordered basally by similar markings..7

Second discal and submarginal bands not bordered with orange-yellow, marginal patch, bluish white.....9

7. Outer margin of primaries straight; outer margin of secondaries straight from Sc to M_3, giving them an angulate shape. Lower surface of primaries: second discal band straight and parallel to outer margin, curving abruptly basad to meet the costal margin; submarginal band well developed, the central portion bowed away from the outer margin. Male with an androconial patch; genitalia as in figure 5. Wings brownish-gray above.....*pephredo*

Outer margin of primaries convex; secondaries very weakly angulate. Lower surface of primaries: second discal and submarginal bands parallel, usually very weakly developed. Wings delicate; mouse-gray above.....8

8. Male with an androconial patch, genitalia as in figure 10. Lower surface: cross bands narrow, reddish in color; wings brownish with very few dark striations.....*nayarit*

Male without androconial patch, genitalia as in figure 11. Cross bands broad, though incomplete, brown in color. Ground color of lower surface yellow-tan, traversed by numerous heavy striae.....*pseudopephredo*

9. No androconial patch in male; wings on upper surface homogeneous gray or gray-brown; body and wings delicate; genitalia as in figure 6; length of primaries in males, 15–17 mm.; in females, 17–20 mm.....10

Male with an androconial patch; wings on upper surface of a brownish-gray color, with some red suffusion on both surfaces. Transverse bands on lower surface usually with

brick-red suffusion. Length of primaries in males, 18–22 mm.; in females, 18–25 mm.....11

10. Ground color on upper surface brownish-gray, lower surface also brownish-gray, sometimes suffused with yellowish; transverse bands frequently heavy and complete
gemma freemani

Ground color on both surfaces grayish, rarely having a brownish cast on lower surface; transverse bands usually weakly developed.....*gemma gemma*

11. The second discal band of the lower surface of secondaries straight, outwardly toothed, extending to the costal margin where it connects with the second discal of the primaries. The valves of the male genitalia terminate in a point as in figure 3.....12

The second discal band on the lower surface of secondaries irregularly curved away from the outer margin and extending to the costa where it appears to meet the submarginal band of the primaries. The valves of the male genitalia terminating in a dorsally turned hook as in figure 4.....13

12. Transverse bands on lower surface of primaries well defined, brownish in color. Upper surface: male ground color more or less homogeneous brown with only a slight suffusion of red.....*pyracmon pyracmon*

Transverse bands on under side of primaries reddish; the first and second discal thin; subcostal almost obsolescent consisting of a row of small, thin, disconnected spots. Both sexes usually suffused with red on the upper surface
pyracmon henshawi

13. The marginal patch basal to the ocelli on lower surface of secondaries is bright gray, traversed by regular dark striae, and extends to or almost to the second discal band
dorothea dorothea

The marginal patch of the underside of secondaries extends only halfway to the second discal band, with very little gray, but more of the ground color invading the area, and is traversed only by a few irregular dark striae
dorothea maniola

Checklist of Subgenus Cyllopsis

Genus *Euptychia* Hübner, 1818, Ver. Bekannt. Schmett., page 54. Genotype: *Papilio herse* Cramer, 1775.

Subgenus *Cyllopsis* Felder, 1869, Verh. Zool.-Bot. Gesellsch. Wien, vol. 19, p. 474. Genotype: *Cyllopsis hedemanni* Felder, 1869.

gemma gemma (Hübner) Zutr. Ex. Schmett., 1818, f. 7, 8.
gemma freemani (Stallings & Turner) 1946, Can. Ent., vol. 78, p. 136.
Synonym as form *inductura* (Stallings & Turner) ibid.
dorothea dorothea (Nabokov) 1942, Psyche, vol. 49, p. 64.
Synonym *edwardsi* (Nabokov) ibid. p. 66.
Synonym *avicula* (Nabokov) ibid. p. 67.
Synonym *texana* (Wind) 1946, Pan. Pac. Ent., vol. 22, p. 27.
dorothea maniola (Nabokov) 1942, Psyche, vol. 49, p. 68.
pephredo Godman & Salvin, 1882–1902, Biol. Cent. Am., Ins. Lep., vol. 2, p. 657.
pseudopephredo R. Chermock, in this paper.
nayarit R. Chermock, in this paper.
pyracmon pyracmon (Butler) 1866, Proc. Zoöl. Soc. Lond., p. 499.
Synonym *hilaria* Godman & Salvin, Biol. Cent. Am., Ins. Lep., vol. 2, p. 658.
pyracmon henshawi (Edwards) 1876, Trans. Am. Ent. Soc., vol. 2, p. 658.
hedemanni Felder, 1869, Verh. k.k. Zool.-Bot. Ges. Wien, p. 474.
Synonym *ithama* Butler, Lep. Ex., p. 9.
Synonym *vetones* Godman & Salvin, 1878, Proc. Zool. Soc. Lond., p. 265.
clinas Godman & Salvin, 1889, Ann. & Mag. Nat. Hist., vol. 3, p. 352.
rogersi Godman & Salvin, 1878, Proc. Zool. Soc. Lond., p. 265.
argentella Butler & Druce, Cist. Ent., vol. 1, p. 98.
philodice philodice Godman & Salvin, 1878, Proc. Zool. Soc. Lond., p. 264.
philodice nelsoni Godman & Salvin, Biol. Centr. Amer., p. 91.

Personal

Mrs. Ethel Melsheimer Miller, librarian for the Department of Entomology at the Ohio State University, has retired from active service but is planning a cumulative index of the Ohio Journal of Science and its predecessor, the Ohio Naturalist. Mrs. Miller is a great, great granddaughter of Frederick Valentine Melsheimer, one of America's entomological pioneers.

Undescribed Species of Crane-Flies from the Western United States and Canada (Dipt.: Tipulidae). Part VIII

By CHARLES P. ALEXANDER, University of Massachusetts, Amherst, Massachusetts

The preceding part under this title was published in ENTOMOLOGICAL NEWS, 58: 61–67. Most of the species discussed herewith were taken by me in California and the types are preserved in my personal collection of these flies. One further species was found in the California Academy of Sciences and was loaned to me for study by Dr. E. S. Ross, curator of the insect collections.

Tipula (Oreomyza) sequoicola new species

Size small (wing, male, less than 10 mm.); general coloration light gray, the praescutum with four narrow reddish brown stripes; claws of male toothed; wings with a pale grayish tinge; no squamal setae; cell M_1 about three times the length of its petiole; male hypopygium with the ninth tergite entirely pale, its caudal margin with a deep and narrow median notch, the broad lateral lobes truncated; outer dististyle pale, the distal third narrowed; beak of inner dististyle slender, the retracted lower beak terminating in a rounded blackened knob; eighth sternite terminating in two separate groups of long reddish setae, the apical margin between produced into a long median lobe that is only a little shorter than the setae, its surface with abundant small hairs.

♂. Length about 8.5 mm.; wing 9.5 mm.

Frontal prolongation of head testaceous yellow; nasus distinct; palpi with basal segments obscure yellow, the outer ones brown. Antennae with the scape and pedicel yellow, flagellum brown; flagellar segments with the basal enlargements only feebly indicated; segments about equal in length to the verticils. Head light gray.

Pronotum and mesonotum light gray, the praescutum with four narrow reddish brown stripes, the intermediate pair separated by a space that is wider than either stripe; scutal lobes

variegated with reddish brown. Pleura and pleurotergite uniformly pale gray. Halteres with stem pale, knob darkened. Legs with all coxae pale gray; trochanters yellow; remainder of legs pale brown, the outer tarsal segments darker; tarsal claws (male) toothed. Wings with a pale grayish tinge, the short-oval stigma darker; obliterative areas inconspicuous or lacking; veins brown. Venation: *Rs* nearly twice *m-cu;* cell M_1 about three times its petiole; *m* oblique, the outer end of cell *1st* M_2 pointed; M_{3+4} short, about three-fifths as long as the basal section of M_{1+2}; *m-cu* close to the fork of *M;* cell *2nd A* wide.

Abdomen testaceous yellow, unpatterned or virtually so. Male hypopygium with the tergite entirely pale, without ventral or marginal armature; posterior border with a deep and relatively narrow median notch, the broad lateral lobes truncate, provided with short scattered setae only. Ninth sternite with its appendage a subglobular lobe that is cushioned with coarse subspinous setae. Outer dististyle elongate, pale, the outer third narrowed, the lower margin and apex with relatively short setae, the dorsal portion with fewer long coarse bristles. Inner dististyle with the beak slender, the lower beak far retracted, at base of the former, terminating in a rounded black knob; dorsal crest with the corrugations widely spaced, the setae nearest the beak very small, becoming longer and coarser outwardly; posterior crest high but very pale to hyaline, the posterior corrugations more crowded; outer basal lobe short, more or less sclerotized, near apex with three or four setae that are stronger than the others. Eighth sternite near posterior margin with two separated groups of long reddish setae; near margin between these two groups an elongate median structure, appearing as a long tail-like pale lobe, the surface with abundant short hairs.

Habitat. CALIFORNIA. *Holotype:* ♂, Sequoia National Park, Giant Forest near Sunset Camp, altitude 7000 feet, July 18, 1946 (C. P. Alexander); in grove of Jeffrey Pine, *Pinus jeffreyi* Murray, resting on trunk of this species.

This small fly seems to be most nearly allied to *Tipula* (*Oreomyza*) *mandan* Alexander, despite the unproduced basistyle of

the male hypopygium. The elongate median appendage of the eighth sternite is distinctive.

Limnophila (Elæophila) nupta new species

Mesonotal praescutum gray with four brown stripes; wings relatively narrow, faintly tinged with yellow, conspicuously patterned with brown, the areas restricted to the vicinity of the veins; *Sc* short, Sc_1 ending a short distance before the fork of *Rs;* abdomen bicolored; male hypopygium with the basistyle at apex provided with a brush of long yellow setae; outer dististyle entirely blackened, the spine of the outer margin strong, the outer third of style more narrowed, with six or seven spines before the strong apical point; phallosome on either side of the small aedeagus produced into a strong black spine.

♂. Length about 6.5 mm.; wing 7.4 mm.

Rostrum and palpi brownish black. Antennae with the basal segments black, the scape pruinose, flagellum paler; antennae of moderate length; verticils longer than the oval segments. Head gray; anterior vertex broad.

Pronotum gray. Mesonotal praescutum light gray, with four dark brown stripes that are separated by narrow gray lines; pseudosutural foveae black, conspicuous; posterior sclerites of notum somewhat darker gray, the scutum weakly patterned with darker. Pleura gray. Halteres with stem pale, knob dark brown. Legs with the coxae and trochanters yellow; femora yellow basally, broken at near midlength. Wings relatively narrow, faintly tinged with yellow, more saturated in the prearcular and basal costal fields; a conspicuous brown pattern, including about six larger costal areas, the second at origin of *Rs,* and the third at tip of *Sc* relatively close together and confluent in the costal cell; other dark areas over cord, outer end of cell *1st* M_2, over the supernumerary crossvein in cell *M,* and at ends of the longitudinal veins, all dark areas being restricted to the vicinity of the veins; veins brown, slightly darker in the patterned areas, light yellow at the wing base. Venation: *Sc* short, Sc_1 ending a slight distance before the fork of *Rs,* Sc_2 about opposite two-thirds *Rs,* the latter angulated and long-spurred at origin; cell M_1 subequal to its petiole; cell *1st* M_2 small with *m-cu* at about one-third its length.

Abdomen bicolored, the bases of the segments yellow, the narrower apices dark brown, the pale color clearer on the more proximal segments. Male hypopygium with the outer apical angle of basistyle slightly produced into a blackened obtuse lobe that bears a group of long yellow setae that are subequal in length to the outer dististyle. Outer dististyle entirely blackened, relatively narrow, the spine of the outer margin strong, placed at near two-thirds the length; outer third of style more narrowed, the apex a strong curved spine with about six or seven smaller teeth on margin back from this spine. Inner dististyle an oval pale lobe with abundant pale setae but with no modified brush or pencil. Phallosome on either side of the small aedeagus produced into a strong black spine that is about three-fourths as long as the aedeagus itself.

Habitat. CALIFORNIA. *Holotype:* ♂, Yosemite National Park, Bridalveil Creek, altitude 7075 feet, July 22, 1946 (C. P. Alexander).

The most similar species is *Limnophila* (*Elæophila*) *angustior* Alexander which agrees most closely in the shape and coloration of the wings and in the general structure of the male hypopygium, including the brush of setae at apex of the basistyle. It differs in all other details of the hypopygium, including the outer dististyle and the lack of the spines subtending the aedeagus.

Elephantomyia (Elephantomyia) curtirostris new species

Mesonotum yellow, the praescutum with three brown stripes; rostrum unusually short, only about two-fifths as long as the wing; antennae black; wings with a faint yellow tinge, restrictedly patterned with brown, including very narrow seams over most of the veins; abdomen yellow, the tergites with a narrow pale brown central stripe, widened on the proximal two segments; sternites yellow, the lateral borders brownish black.

♀. Length, excluding rostrum, about 10.5 mm.; wing 10.5 mm.; rostrum 4 mm.

Rostrum unusually short, dark brown throughout, about two-fifths as long as the wing; palpi dark brown. Antennae with the scape black, sparsely pruinose; pedicel piceous brown; flagellum black; fusion-segment more than twice the length of the

succeeding segment. Head light gray; anterior vertex (female) narrow, about one-fourth greater than the diameter of the scape.

Pronotum obscure yellow. Mesonotal praescutum yellow, with three brown stripes, the median one broad and distinct, the laterals more diffuse; posterior interspaces obscured; centers of the scutal lobes and the mediotergite dark brown, the scutellum darkened medially, the remainder of mesonotum yellow. Pleura yellow, with a major brown area on the mesopleura. Halteres broken. Legs with the coxae and trochanters yellow; femora yellow, the tips dark brown, broadest on the fore pair where more than the outer half is included, narrowest on the posterior legs where about the outer tenth is included; tibiae obscure brownish yellow, the tips narrowly darkened; tarsi brownish yellow, the terminal two segments dark brown; tibial spurs present. Wings with a faint yellow tinge, restrictedly patterned with brown, including pale brown cells *C* and *Sc*, a long darker brown stigma, and very narrow but evident pale brown seams over most of the veins, lacking on *1st A;* veins brown. Venation: *Sc* relatively short, the strong Sc_2 ending a short distance before the outer end of *Rs,* the weak Sc_1 at its tip; branches of *Rs* extending generally parallel to one another, diverging slightly at their outer ends; *m-cu* at midlength of the lower face of cell *1st* M_2.

Abdomen yellow, the lateral borders of the sternites brownish black, more or less interrupted on the narrow basal rings of the segments; on the seventh sternite the posterior border is similarly darkened; tergites with a delicate pale brown median line, more extensive on segments one and two, on the latter more or less hour-glass shaped. Ovipositor with the valves, especially the cerci, elongate.

Habitat. ARIZONA. *Holotype:* ♀, Chiricahua Mountains, Cochise Co., Rustler Park, altitude 8500 feet, July 26, 1927 (J. A. Kusche); California Academy of Sciences.

The present fly is very different from the other regional species, including the only other Nearctic species, the genotype, *Elephantomyia* (*Elephantomyia*) *westwoodi* Osten Sacken and rather numerous Mexican forms. From all of these it differs especially in the unusually short rostrum which is only about two-fifths as long as the wing.

A New Species of Hippomelas with Notes on Two other Buprestidae (Coleoptera)

By J. N. KNULL, Department of Zoology and Entomology, Ohio State University, Columbus, Ohio

Hippomelas brunneata n. sp.

Female. Short, robust; head, prothorax, scutellum, ventral surface and legs dark bronze, elytra brown, pubescence short, inconspicuous, irregularly clothed with white flocculent material.

Head convex, median line on vertex extending down front; clypeus deeply, broadly emarginate; surface densely, finely punctured; antennae extending beyond middle of pronotum when laid along side, scape stout, second segment longer than wide, third as long as fifth and sixth taken together, fourth shorter than third, segments five to ten inclusive as long as wide, eleventh with appendicle, serrate from fourth segment.

Pronotum wider than long, widest in front of middle; sides broadly rounded in front, sinuate near base, lateral margin extending from base, not reaching middle; anterior margin with broad lobe; posterior margin sinuate, median lobe broad; disk convex, a median depression separating two smooth callosities in front, transversely depressed in front of scutellum; surface irregularly coarsely punctured. Scutellum much wider than long, rounded in rear.

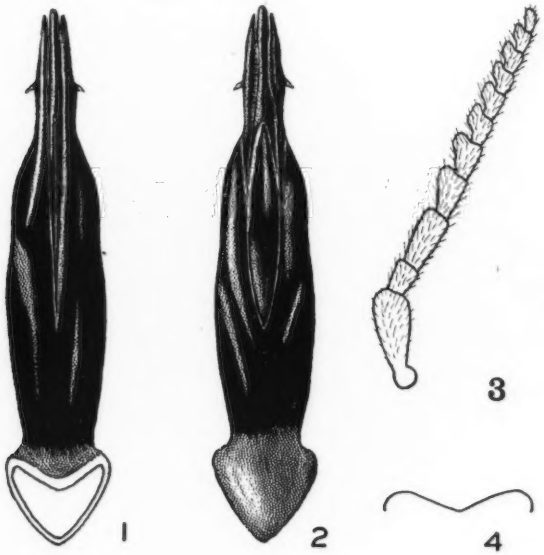
Elytra back of base wider than widest part of pronotum; sides sinuate in front, converging to subtruncate apices, serrulate on apical third; disk convex; surface densely punctured, punctures same size as those on head, indistinctly striate on apical fourth.

Abdomen beneath convex; surface finely densely punctate. Posterior tarsi shorter than tibiae, first segment as long as third and fourth together, other segments decreasing in length.

Length 13 mm.; width 4.2 mm.

Described from unique female specimen in collection of author labeled Palm Springs, CALIFORNIA, June 30, 1946, D. J. and J. N. Knull collectors.

This species is close to *H. californica* (Horn) and can be separated by its larger size, brown elytra, more deeply emarginate clypeus and wider, shorter, less parallel sided metaepisternum.



CHRYSOBOTHRIS MULTISTIGMOSA Mann.

1. Male genitalia, dorsal view. 2. Ventral view of No. 1. 3. Male antenna. 4. Clypeus.

Acmaeodera lataflava Fall

Reared from dead flower stems of *Agave consociata* Trel. collected on Pinyon Flat, Santa Rosa Mountains, California.

Chrysobothris multistigmosa (Mann.),[1] Figs. 1, 2, 3 and 4.

Colobogaster multistigmosa Mannerheim, 1837, Bul. Société Impériale des Naturalistes Mosc., 10 (8) : 82.

[1] Determination by W. S. Fisher, U. S. N. M.

Type locality of this species is Oaxaca, Mexico. Specimens are at hand from Arizona: Wickenburg, July 8, 1937, August 20, 1938; Congress Junction, July 7, and Baboquivari Mountains, Sept. 1, 1938, all collected by D. J. and J. N. Knull.

This species looks very much like *C. basalis* Lec., and will run to it in Fisher's key.[2] The male can be distinguished by the elongate third antennal segment and by the genitalia.

A Note on the Occurrence of the Flea, Corrodopsylla hamiltoni Traub, on Shrews

By W. R. Enns, Department of Entomology,
University of Missouri

On 11 March 1947, a specimen of *Cryptotis parva* Say,[1] the little short-tailed shrew, was taken at Columbia, Missouri by the writer. On this shrew several pairs of fleas were found which were determined by Major Robert Traub of the U. S. Army Medical Museum, Washington, D. C., as *Corrodopsylla hamiltoni* Traub.

This flea was described in 1944 from specimens taken on *Blarina* in Illinois. According to Major Traub, two females of the flea are known which were taken on *Cryptotis* in New York.

Mr. E. W. Jameson, Jr., of Cornell University, has informed me that he took forty-seven specimens of *C. hamiltoni* on *Cryptotis* and eight specimens on *Blarina brevicauda* at Lawrence, Douglas County, Kansas in 1946.[2]

It has not been determined whether *Cryptotis* and *Blarina* are parasitized to the same degree by this flea but in view of Jameson's records, it would appear that *Cryptotis* is the more common host. Apparently it is restricted to shrews.

[2] W. S. Fisher, 1942, Misc. Pub. U. S. D. A., 1-274.

[1] Determined by Dr. William H. Elder, Assistant Professor of Zoology, University of Missouri.

[2] To be published as part of a thesis on the prairie vole in the Museum of Natural History Publication, University of Kansas.

Some Synonymy in Coniontellus (Coleoptera: Tenebrionidae)

By Ira La Rivers, University of California, Berkeley

In 1908, Col. Thomas L. Casey described three species from a series of the nondescript genus *Coniontellus* collected in and about Reno, Nevada (Washoe County), *C. hystrix, C. longipennis* and *C. ampliatus.* Previously (1890), he had described *C. inflatus* from the same locality, also from material he had collected. The late Dr. Frank E. Blaisdell, Sr., recognized the species *longipennis, ampliatus* and *inflatus* among my material from Reno and vicinity.

In his 1908 key to the species, Casey distinguished between *hystrix-longipennis* and *inflatus-ampliatus* by integumental coloration alone, listing the first two as "castaneous in color," and the remaining two species as "black." During a familiarity of nearly fifteen years with the genus as it is represented in the Truckee Meadows (in which Reno is situated), I was led to a perusal of the status of the four described species by the facts that (a) all of Casey's descriptions seemed to be rather arbitrarily drawn up with respect to the characters used in differentiating the species, (b) all his descriptions seemed to fit equally well any and all specimens of the very large series I had accumulated, and (c) such variation in size and coloration was exhibited by my specimens, some of it obviously seasonal, as to render these characters, as used by Casey, of little taxonomic significance.

After studying several hundred specimens of the genus from in and about Reno, I am convinced that but one species is present, a species exhibiting considerable variation in size and coloration, but no more abnormal in these respects than other species of *Coniontellus* and the closely-related and much larger genus *Coniontis,* with which Casey also experimented. Castaneous specimens are merely tenerals. The synonymy should be indicated as:

Coniontellus inflatus Casey 1890
C. hystrix Casey 1908
C. longipennis Casey 1908
C. ampliatus Casey 1908

As I have mentioned before (1946), no lasting interpretation of either *Coniontis* or *Coniontellus* (and related groups) will be possible until the taxonomic possibilities presented by the chaetotaxy of larvae are thoroughly investigated. And even then, it will be a major task to correlate such larvae with the adult descriptions of Casey. A consideration of the extensive synonymy in the now large genus *Coniontis* will be reserved for a future time.

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LA RIVERS, IRA. 1946. On the genus Trogloderus (Coleoptera: Tenebrionidae). Ent. News, 57 (*2*): 35–44.

Review

NATURE AND PREVENTION OF PLANT DISEASES. By K. Starr Chester. 2d ed. Blakiston Company, Philadelphia, 1947. Pp. xi + 525, 224 figs. $5.00.

Entomologists that are fascinated with the complex life-histories of certain insects, e.g., *Adelges, Micromalthus,* will be amazed at the involved life-history of the organism causing stem rust of wheat that begins this text. Many other plant diseases are also described as to recognition, etiology and control. The book is a practical one but it also expounds clearly the scientific principles of plant pathology that are necessary for a true understanding of the disease-producing organisms. Some insect vectors mentioned are the leafhoppers that carry sugar-beet curly top, bees that carry fire-blight and the beetles that carry Dutch elm disease. In one instance at least, in peach yellows, the causative virus is transmitted in no other way except through the feeding of the leafhopper *Macropsis trimaculata,* in the body of which the virus must undergo an incubation period of from 8 to 28 days, after which it is found in the saliva.

The book is exceptionally well written, is concise yet very readable.—R. G. SCHMIEDER.

Current Entomological Literature

COMPILED BY EDWIN T. MOUL AND RAYMOND Q. BLISS.

Under the above head it is intended to note papers received at the Academy of Natural Sciences of Philadelphia and the University of Pennsylvania, pertaining to the Entomology of the Americas (North and South), including Arachnida and Myriopoda. Articles irrelevant to American entomology will not be noted; but contributions to anatomy, physiology and embryology of insects, however, whether relating to American or exotic species will be recorded.

This list gives references of the current or preceding year unless otherwise noted. Continued papers, with few exceptions, are recorded only at their first installment.

For records of Economic Literature, see the Experiment Station Record, Office of Experiment Stations, Washington. Also Review of Applied Entomology, Series A, London. For records of papers on Medical Entomology, see Review of Applied Entomology, Series B.

NOTE: The figures within brackets [ ] refer to the journal in which the paper appeared, as numbered in the List of periodicals and serials published in our January and June issues. The number of the volume, and in some cases, the part, heft, &c. is followed by a colon (:). References to papers containing new forms or names not so stated in titles are followed by (*); if containing keys are followed by (k); papers pertaining exclusively to Neotropical species, and not so indicated in the title, have the symbol (S).

Papers published in ENTOMOLOGICAL NEWS are not listed.

GENERAL—Bailey, J. W.—Report on the status of the entomological collections in certain European museums, 1945. [5] 40: 203–12 **Blackwelder, R. E.**—The dates and editions of Curtis' British Entomology. [82] 107: No. 5: 1–27, ill. **Chamberlain, F. K.**—Frederick Edward Winters (obituary). [18] 42: 72–74. **Grensted, L. W.**—On the formation of family names. [28] 83: 137–41. **Light and Weesner**—Methods for culturing termites. [80] 106 (2745): 131. **Olsen and Davies**—The story of Syrphus weidemanni, a fly, magnified in plastic. [45] 55: 107–13. **Peyer, B.**—An early description of Drosophila. [42] 38: 195–99. **Talbot, C.**—A little-known method for preserving larvae of Lepidoptera and other insects in the dry state. [28] 83: 152. **Van Cleave and Ross**—Use of trisodium phosphate in microscopical technique. [80] 106 (2748): 194. **Weiss, H. B.**—Entomological medicaments of the past. [45] 55: 155–68. **Williams, C. B.**—The field of research in preventive entomology. (Pres. address, Assoc. Appl. Biol.) [4] 34: 175–85.

ANATOMY, PHYSIOLOGY, MEDICAL—Anon.—Dry-cleaning fluid and the kelp-fly. [45] 55: 114. **Daviault, L.**—Action de la température et de l'humidité sur la biologie de Pristiphora geniculata (Tenth ed.). [Rev. Canad. de Biol.] 6: 366–68. **Davis, R. A.**—Notes on urticating lepidopterous larvae becoming of some medical importance. [68] 22: 3–4. **Dustan, Armstrong and Putman**—The influence of air currents on the insecticidal action of DDT, benzene hexachloride, hercules toxicant 3856, and velsicol 1608. [23] 79: 45–50, ill. **Gier, H. T.**—Growth

rate in the cockroach Periplaneta americana. [5] 40: 303–17. **Judd, W. W.**—The proventriculus of a ground beetle, Chlaenius sp. (Carabid). [23] 79: 58–60, ill. **Krause, J. B.**—The development of the gonads of the wood-eating beetle Passalus cornutus Fab. (Passal.). [5] 40: 172–202, ill. **Leone, C. A.**—Systematic serology among certain insect species. [12] 93: 64–71. **Murray, D.**—Some unusual forms of genitalia. [29] 59: 90, ill. **Reiter, R.**—The coloration of anther and corbicular pollen. [58] 47: 137–51, ill. **Richards, A. G.**—Studies on arthropod cuticle. [5] 40: 227–40. **Roebuck, Broadbent and Redman**—The behaviour of adult click beetles of the genus Agriotes (A. obscurus, A. lineatus and A. sputator). [4] 34: 186–96. **Russell, W. C.**—Biology of the dermestid beetle with reference to skull cleaning. [Jour. of Mammalogy] 28: 284–87. **Sautet, Levavasseur et Vuillet**—Action biologique des ultra-sons sur les culicides. [Rev. Canadienne de Biol.] 6: 179–210, ill. **Schneirla, T. C.**—A study of army-ant life and behavior under dry season conditions with special reference to reproductive functions. [2] 1336: 1–20, ill. **Simmonds, F. J.**—Improvement of the sex-ratio of a parasite by selection. [23] 79: 41–44. **Smith, R. I.**—The action of electrical stimulation and of certain drugs on cardiac nerves of the crab, Cancer irroratus. [12] 93: 72–88, ill. **Snodgrass, R. E.**—The insect cranium and the "epicranial suture." [82] 107: 7: 1–52, ill. **Squire, F. A.**—Genetic behaviour of the red form of Dysdercus discolor Walker in the West Indies. [68] 22: 5–7. **Williams, J. L.**—The comparative anatomy of the internal genitalia of some Tineoidea (Gracil-Tisch). [68] 22: 8–17, ill.

ARACHNIDA AND MYRIOPODA—Ewing and Baker—Myonyssus jamesoni a new liponyssid (Acar., Laelapt.) from Blarina brevicauda. [46] 33: 376–79, ill. (k). **Cooley, R. A.**—Dermacentor dissimilis, a new species of tick from S. Mexico. [2] 1332: 1–3, ill. **Goodnight, C. J. and M. L.**—Studies of the phalangid fauna of Central America. [2] 1340: 1–21, ill. (*); Studies of the phalangid fauna of Trinidad. [2] 1351: 1–13, ill. (*). **Grandjean, F.**—Étude sur les Samarisidae et quelques autres Érythroïdes (Acariens). [Arch. de Zool. Exp. et Gén.] 85: 1–126, ill. (*). **Grant, D. C.**— N. Amer. mites of the genus Laelaps (Acar., Parasit.). [50] 12: 1–21, ill. (k*); Redescription of a snake-infesting mite (Parasit.). Ibid.: 22–24, ill. **Moore, E. R. and G. C.**—The helminth parasites of cottontail rabbits in Alabama with notes on the Arthropod Linguatula serrata (Penta-

stomidae). [Jour. of Mammalogy] 28: 279–84. **Muma, M. H.**—North American Agelenidae of the genus coras Simon. [2] 1329: 1–20, ill. (*); North American Agelenidae of the genus Wadotes. [2] 1334: 1–12, ill. (*). **Petrunkevitch, A.**—Fossil spiders in the collection of the Amer. Museum of Natural History. [2] 1328: 1–36, ill. (*). **Wharton, G. W.**—Studies on N. A. chiggers. 2. The subfamilies and Womersia strandtmani n. g., n. sp. [46] 33: 380–84, ill. (k).

SMALLER ORDERS—Ahmad, M.—New termites from the Indo-Malayan and Papuan regions. [2] 1342: 1–7, ill. (*). **Borror, D. J.**—Notes on Ypirangathemis Santos (Libellul.) with a description of the female of Y. calverti Santos. [5] 40: 247–56, ill. (S). **Broadhead, E.**—New species of Liposcelis (Corrodentia) in England. [88] 98: 41–58, ill. **Fraser, F. C.**—The Odonata of the Ivory Coast based on the mission of Dr. R. Paulin and P. Lepesme. [88] 98: 19–39, ill. (*). **Klots, E. B.**—Chinese dragonflies in the Amer. Museum of Natural History. [2] 1341: 1–15, ill. (*). **Light and Weesner**—Methods for culturing termites. [80] 106 (2745): 131.

ORTHOPTERA—Chagnon, G.—The cockroaches of the Province of Quebec. [23] 79: 57–58 (k). **Gier, H. T.**—(See under Anatomy.) **Leone, C. A.**—(See under Anatomy.) **Rehn, J. A. G.**—African and malagasy Blattidae. Part IV. [62] 99: 59–92, ill. (k*). **Strohecker, H. F.**—Some southwestern Gryllacrididae. [5] 40: 241–46 (*).

HEMIPTERA—DeLong, D. M.—A new genus and species of Mexican leafhopper related to Mesamia (Cicadell.). [18] 42: 63–64, ill. **DeLong and Hershberger**—The genus Mesamia in Mexico (Cicadell.). [5] 40: 257–65, ill. (*). **Esselbaugh, C. O.**—Some notes on the biology of Hymenarcys aequalis Say (Pent.). [18] 47: 25–30. **Evans, J. W.**—A natural classification of leaf-hoppers (Jassoidea). Part 3. Jassidae. [88] 98: 105–271, ill. (k). **Knowlton, G. F.**— Schizolachnus pini-radiate. [18] 42: 62; Two poplar aphids. Ibid.: 71; Myzus aphid notes. Ibid.: 74; A few aphids. [Ibid.]: 77; Geocoris notes. Ibid.: 79. **Mathis, W.**—Biology of the Florida red scale in Florida. [31] 29: 13–35. **Milliron, H. E.**—(See under Hym.) **Pritchard, A. E.**—Hoplopleura oenomydis Ferris, a louse found on domestic rats in the U. S. [46] 33: 374–75. **Sampson, W. W.**—Additions and corrections to "a generic synopsis of the Aleyrodoidea." [18] 42: 45–50 (k). **Squire, F. A.**—(See

under Anatomy.) **Usinger, R. L.**—Classification of the Cryphocricinae (Naucor.). [5] 40: 329–43 (k*S).

LEPIDOPTERA—Bell, E. L.—New species and subspecies of neotropical Hesperiidae. [2] 1330: 1–9, ill. **Carpenter, G. D. H.**—The geographical distribution of the forms of the African nymphaline butterflies Charaxes etesipe and Ch. penricei. [88] 98: 91–104, ill. **Davis, R. A.**—(See under Anatomy.) **Dos Passos, C. F.**—Notes on Grinnell's types of Erynnis Schrank. (Hesperiidae). [2] 1337: 1–3; Erebia youngi Holland, its subspecies and distribution (Satyridae). [2] 1348: 1–4 (*). **Gardner, J. C. M.**—On the larvae of the Noctuidae, III. [88] 98: 59–90, ill. **Richards, A. G.**—(See under Anatomy.) **Talbot, C.**—(See under General.) **Williams, J. L.**—(See under Anatomy.)

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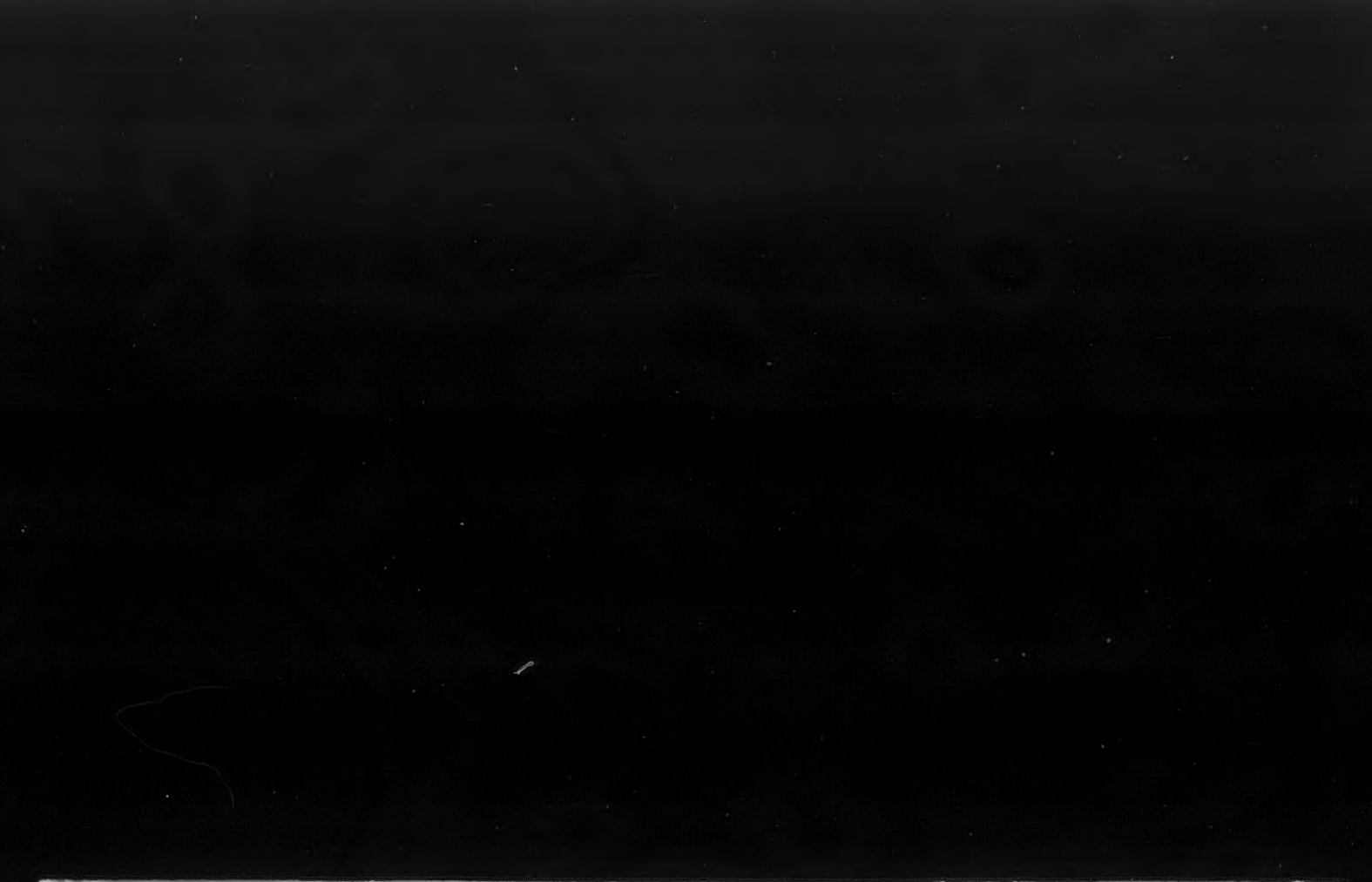
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